Partnership Opportunity Document (POD)

for

NASA’s Goddard Space Flight Center (GSFC)

R/F Instrument Front End System

April 23, 2014

General Information

Contracting Office Address

NASA's Goddard Space Flight Center, Code 460.0, Greenbelt, MD 20771

1.0 Introduction and Scope

This partnership opportunity is for the development, integration, test, delivery and sustaining engineering of a spaceflight level Radio Frequency (R/F) front end for science instrument to support the NASA New Frontiers, Europa and Discovery Announcement of Opportunities (AO). NASA's Goddard Space Flight Center (GSFC) is seeking a partner to provide this R/F front end for a science mission proposal to this opportunity. NASA's GSFC Discovery, New Frontiers, and Europa mission proposals are designed to meet the science goals of the Discovery program (and hence those outlined in the extant National Research Council Decadal Survey for Planetary Exploration (http://solarsystem.nasa.gov/multimedia/download-detail.cfm?DL_ID=742), as currently understood.

As in the recent past, the AO is a two-step process, with the first proposal response primarily focused on the scientific merit and technical feasibility of the proposed mission and its associated scientific investigation. The initial submissions will then be down-selected after formal peer review, and the resultant subset of proposals will be funded to perform Phase A mission concept studies. During Phase A, proposals will be expanded and refined to detail the entire end-to-end mission life cycle concept, with greater attention to engineering implementation, cost, and schedule.

This partnership opportunity is issued to formally select a teaming partner to help prepare NASA's GSFC Discovery, New Frontiers, and Europa candidate instrument concepts for the initial proposal submittal; to assist in the Phase A concept studies if the mission is down-selected; and to provide a flight-qualified R/F front end should the mission be selected for flight by NASA Headquarters.

For the portion of this partnership opportunity dealing with the preparation of the initial submission (proposal) to the Discovery, New Frontiers, or Europa AO, there will be no exchange of funds between the teaming partners. Funding will be available for Phase A and subsequent phases should the mission be competitively selected for those additional phases.

NASA's GSFC reserves the option to not select any teaming partners under this POD offering on the basis of materials received.

2.0 Technical Objectives

2.1 Planetary science Decadal Survey goals require the investigation of planets and small bodies. The requested hardware will interface to the spacecraft and the instrument electronics.

2.2 Technical Information
2.2.1 Frequency Range: 10 MHz bandwidth centered at 20 MHz
2.2.2 Radiated Power: 10W peak
2.2.3 Total mass and input power should be minimized where possible

2.2 Key Technologies –All technologies presented should have a pathway development for space deployment with Technology Readiness Level maturity of 6 by early 2017.

3.0 Pre-selection Support

3.1 Initial Proposal Support

SOW: It is expected that the selected respondent will provide support using their own resources to help develop and write the mission proposal in response to the AO in the area of the R/F front end system design and mission implementation. This will involve meeting with the scientists and the overall mission engineering team: (a) to help define the end-to-end performance and interface requirements; (b) to identify study topics; and (c) to predict performance. This will include cost estimation for each and all mission phases. The period of performance for this interval is expected to last until submission of the initial proposal.

3.2 Phase A Study and Phase A Proposal Support

SOW: If the mission is selected for a Phase A study, the proposal team will receive $TBD (total Phase A funding level will be identified in the AO) to conduct a Phase A study and submit a detailed Concept Study Report (CSR) to NASA. The respondent providing the R/F front end will be allocated a portion of this total to continue proposal support during the CSR duration. The respondent will be expected to contribute to designing, documenting, and costing the R/F front end for inclusion in the final Discovery, New Frontiers, and Europa Concept Study Report (as specified in the AO). The period of performance for this interval is expected to last approximately 6 to 12 months after notification that the mission was selected for Phase A study. In addition, the “potential partner” can propose contracting strategies (to their advantage) if selected.

POD Response Instructions for Pre-Selection Support

The respondent shall:

1) Demonstrate understanding and demonstrated experience in the design, fabrication, integration and testing of R/F front end systems:

- Identify the means of addressing system requirements that your team assumes are likely to exist, and tasks the R/F front end system is intended for,
- Highlight particularly critical or challenging areas for the design of the R/F front end system ,
- Provide a technical summary/description of the proposed hardware including relevant heritage with cost information.

2) Identify any recommended potential study topics related to the R/F front end system.

3) Indicate the level of resources to be allocated for the proposal phase.
   - Discuss skills that will be provided, the appropriate level of conceptual design, and analyses and trade studies to be performed.

4) Identify pertinent missions for which the respondent has previously provided support for proposal writing in the area of a R/F front end system design, fabrication, integration and testing for the technical specifications listed.

4.0 Development Support

SOW: Following CSR submittal, if the mission is selected for development and launch, the respondent will be responsible for the design, development, and test of the R/F front end system. The respondent is responsible for: identifying the R/F front end system requirements and providing all aspects of the R/F front end system (either directly, or through purchasing or teaming arrangements). The period of performance for this interval is expected to last approximately 28 - 54 months. The date will depend upon selection timelines and budget allocations.

POD Response Instructions for Development Support

The respondent shall:

4) Identify available design and modeling capabilities required to support development of the R/F front end.
5) Describe the level of experience with similar R/F front end and level of experience of supporting personnel.
6) Identify fabrication and testing facilities that will be required to support development and test of the R/F front end.
7) Identify a level of sustaining engineering to assist in potential anomaly resolution during instrument and observatory environmental testing
8) Identify which missions the respondent has successfully supported (relevant to this POD and its technology) and provide a customer reference point of contact.
   - Provide information on recent similar R/F front ends designed and delivered, and describe how that experience is applicable to this mission. This shall include basic information on scope of work, how well the delivered the R/F front end met the cost and schedule estimates, and technical requirements.

9) Provide a Rough Order of Magnitude (ROM) cost estimate and timeline for the scope of the design, fabrication, and testing of the R/F front end. This ROM will not be considered a binding commitment, but will serve as a consideration during the partnership evaluation. Due to the rigid cost cap for Discovery and New Frontiers missions, the cost range for the R/F front end will be an important consideration. The respondent is invited to comment on the reasonableness of the placeholder cost.
10) The mission will be very cost sensitive. List ideas and methods of keeping costs low and the risk of cost growth low, including how to utilize existing open market hardware to minimize costs and provide a more robust system.

5.0 General Instructions for POD Response

Potential respondents are asked to contact NASA's GSFC team as soon as possible after release of this document with a **Notice Of Interest** (intentionally not called notice of intent). This contact does not create an obligation to respond to the POD, but allows NASA's GSFC team to disseminate more details on the parameters of the missions being considered and provide answers to questions from potential partners. **Qualified Notice of Interest respondents will receive further details on the R/F front end system specifications that will facilitate a focused response.** These details will be proprietary and competition sensitive and not to be shared outside the teams necessary to prepare a full response.

Selection criteria for receiving additional details will be consistent with the desire to encourage cost effective partnerships between the Government and Industry. The information will allow the evaluators to determine if respondents are qualified to support the R/F front end development. All organizations responding with an NOI shall include, in the body of the NOI email, the following information as text only:

- Experience and past performance in spaceflight proposal phases
- Experience and past performance in delivered spaceflight R/F front end systems, including cost performance

Please keep the above information brief; do not include images or links.

Organizations with demonstrated heritage in providing R/F front end systems will receive additional details on providing the final POD response.

All questions and answers will be sent to those qualified organizations who respond to the Notice of Interest, while the source of the questions shall be held confidential. Questions and answers that contain information unique to a respondent's proprietary approach will not be shared if they are identified as such. ***Notices of Interest*** **shall be sent to Keith.D.Walyus@nasa.gov via email with 'Notice of Interest' in the subject line, a simple sentence or two expressing interest and an email address to which to send further information.** For purposes of this partnership opportunity,

the point of contact is: Keith Walyus (Keith.D.Walyus@nasa.gov, 301-286-0834). The backup contact is: Steve Pszcolka (steven.e.pszcolka@nasa.gov, 240-684-0674).

Responses to the Partnership Opportunity Document (POD) shall:

1) Be in a presentation format (viewgraphs: such as PPT) that shall not exceed 20 pages. The font size for the text shall be no smaller than 12 point.
2) Address all requirements noted in Sections 3.0 through 6.0 of this document.

Responses will be treated as proprietary information and controlled as such by NASA's GSFC for the US Government.

The respondents shall deliver the requested information in a standard presentation format. Final presentation packages (electronic copy only) must be received by 5 pm EST, **May 7**, 2014. Please send an email with the file to Keith Walyus (contact information noted above).

All respondents will have an opportunity to make oral presentations of their proposed capabilities/concepts. All respondents that intend to make presentations must provide written or electronic notice by 5:00 pm EST on **May 21**, 2014. Notice may be provided by e-mail to Keith Walyus.

Oral presentations will be conducted via telecom approximately two weeks after the response due date. Respondents will have one hour to present their response.

6.0 Selection Criteria for Awarding Partnership Opportunity

The information requested in this Section will allow the evaluators to determine how well the respondent's R/F front end system matches and enables the Discovery mission. Experience in AO proposals and mission development phases are essential for selection.

Selection Criteria

Proposal/Pre-selection Support (50 points)

- Experience (and Team skills) and past performance in proposal phases
- Resource commitment
- Identification and description of key critical areas
- Understanding and addressing general requirements and needs for the proposed R/F front end system on the target mission for which it is intended. Provide a discussion of the assumptions made.
- Recommended design studies

Development Support (50 points)

- Reasonableness of cost and schedule estimates
- Experience and past performance in development phases
- Experience and heritage with respect to similar space flight R/F front end systems
- Experience developing and implementing similar space flight R/F front end systems is a minimum requirement
- Completeness of identification of functions by mission phase
- Cost control measures
- Reasonableness of design and modeling capabilities to support the effort
- Reasonableness of fabrication and testing facilities to support the effort
- Mass, power and data rate of the R/F front end system
- Ability to survive and operate in target environment

7.0 Acronym List

AO	Announcement of Opportunity
CSR	Concept Study Report
EST	Eastern Standard Time
GSFC	Goddard Space Flight Center
NASA	National Aeronautics and Space Administration
NOI	Notice of Interest
POC	Point of Contact
POD	Partnership Opportunity Document
ROM	Rough Order of Magnitude
SOW	Statement of Work
TBD	To Be Determined